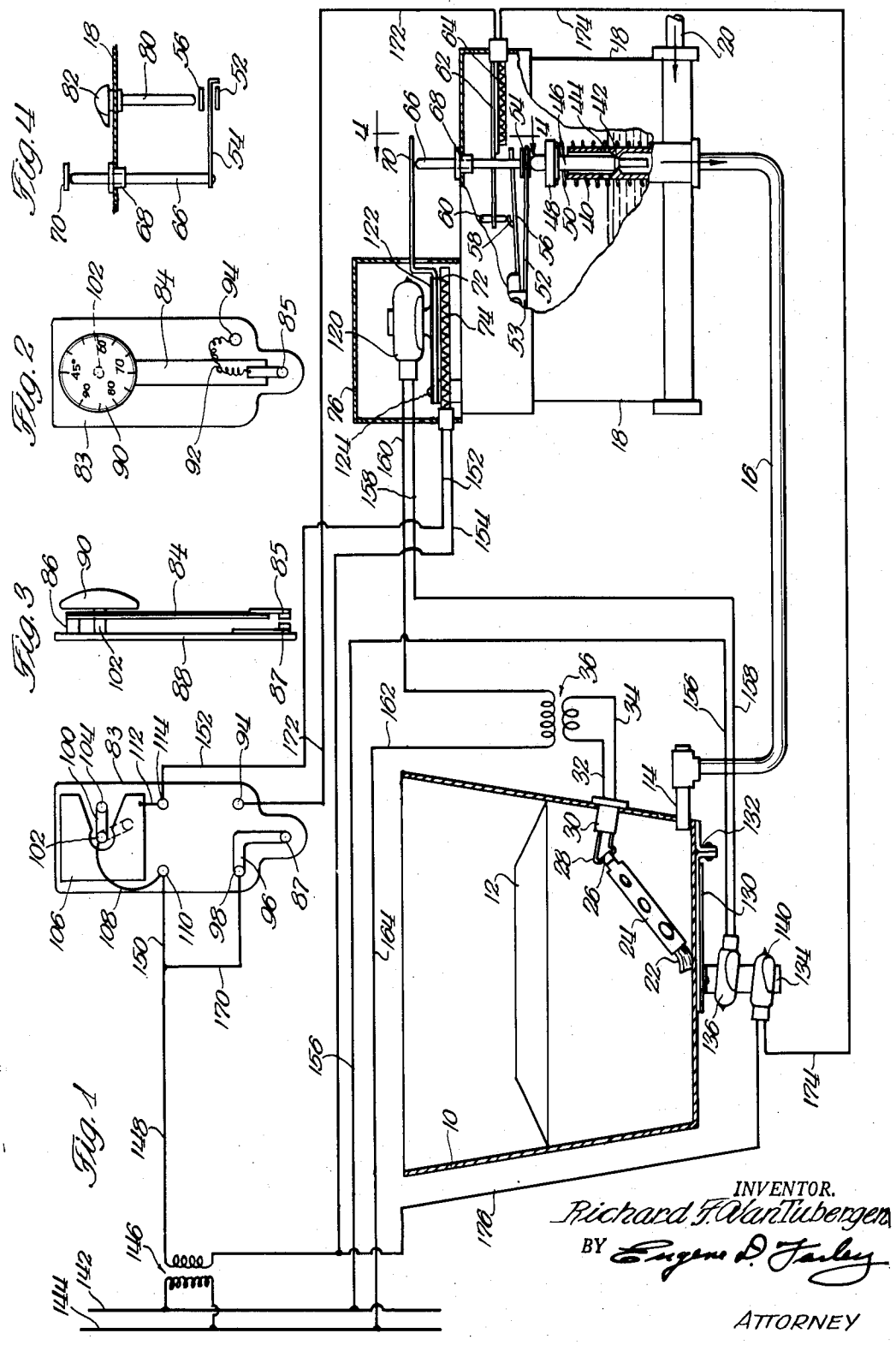
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IGNITION AND FUEL SUPPLY CONTROL APPARATUS FOR FLUID FUEL POT-TYPES BURNERS

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IGNITION AND FUEL SUPPLY CONTROL APPARATUS FOR FLUID FUEL POT-TYPES BURNERS

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The present invention relates to ignition and fuel supply control apparatus for fluid fuel burners, particularly oil burners.

In the conventional pot type oil burner, a problem is presented by the tendency of the burner to snuff out because of drafts occurring within the combustion chamber. This problem is particularly acute during the initial period of operation immediately following the lighting of the burner and before the burner and the combustion chamber have become thoroughly heated. It is complicated by the fact that any reignition means employed should not become active immediately following the snuff out while the burner is still hot, since an explosive gaseous mixture is present therein. It is complicated further because the ignition means should not be active when the burner is flooded with a large quantity of oil which might occur when the snuff out takes place during a period of power failure, whereupon oil flows to the burner but is not consumed thereby.

In my copending patent application, Serial No. 129,941, filed November 29, 1949, now Patent No. 2,688,999, granted September 14, 1954, I have disclosed oil burner control apparatus which is successful in meeting the above problems. The apparatus described in that application is adapted, however, for use with a manually controlled oil burner, and it is a primary object of the present invention to provide fuel supply and ignition control apparatus which may be used in conjunction with thermostatically operated burners as well as with those which are operated manually.

It is another object of this invention to provide ignition and fuel supply control apparatus for fluid fuel burners which will ignite the burner in the first instance and will operate effectively during the period immediately following the initial ignition of the burner, reigniting it automatically in the event that it should be snuffed out.

It is another important object of the present invention to provide ignition and fuel supply control apparatus for fluid fuel burners which automatically will reignite snuffed out burners without hazard of an explosion from accumulated combustible gases.

It is another object of this invention to provide ignition and fuel supply control apparatus for fluid fuel burners which apparatus will shut off the supply of oil to the burner in the event of a power failure before a dangerous amount thereof has accumulated, and which automatically will reignite the burner upon resumption of power service.

It is another object of the present invention to provide ignition and fuel supply control apparatus for fluid fuel burners which apparatus is completely automatic in admitting fuel to the burner and igniting it, reigniting the burner if a snuff out should occur, inactivating the ignition means when the burner is hot, and reducing the fire to pilot fire level, when heat no longer is required in the area to be heated.

Still another object of the present invention is the provision of ignition and fuel supply control apparatus for fluid fuel burners which apparatus is remarkably simple in construction, easy to install and operate, reliable in operation, and requiring a minimum of attention during use.

The manner which the foregoing and other objects of this invention are accomplished will be apparent from the accompanying specification and claims considered together with the drawings wherein:

Figure 1 is a schematic view illustrating the ignition and fuel supply control apparatus of this invention as applied to a thermostatically controlled oil burner assembly, the thermostat being illustrated in back elevation;

Figure 2 is a front elevation of the thermostat of Figure 1;

Figure 3 is a schematic view in side elevation of the thermostat of Figure 1; and

Figure 4 is a fragmentary diagrammatic view taken along the lines 4—4 of Figure 1.

Generally stated, the presently described ignition and fuel supply control apparatus, as applied to the conventional oil burner supplied with valve means for controlling the flow of oil to the burner, comprises a thermostat stationed in the room to be heated. In an electric circuit with the thermostat is a heat motor to which a first electric switch is physically connected. The heat motor may include a bimetal blade having for its function the closing of the electric switch and also the adjustment of the burner valve to pilot fire position. In series with the first electric switch is an electric ignition element stationed adjacent the burner and adapted to ignite the same when the switch is closed, as when the thermostat is adjusted below room temperature. Temperature responsive means such as a second bimetal blade is stationed adjacent the burner and is actuatable at a predetermined temperature level of the same. A second electric switch is associated with the temperature responsive means in such a manner that the second switch is opened after the burner has reached the desired level. The second switch is in series circuit relationship with the ignition element so that with opening of the switch the ignition element will be de-energized until such time as the burner again is below the predetermined temperature level.

Also associated with the temperature responsive means, as by being mounted thereon, is a third electric switch. This switch is normally open and is electrically connected to a second heat motor which may comprise an electric resistor and a bimetal blade placed in heat exchange relation thereto. The latter blade is operable to adjust the fuel control valve between pilot fire and full fire positions. Therefore, when the third electric switch is closed by operation of the temperature responsive means associated with the burner, the fuel supply valve will be opened and the burner will be on full fire. This condition will continue until the thermostat is satisfied, whereupon the second heat motor will be de-energized, permitting the fuel supply valve to return to its pilot fire position.

Considering the foregoing in greater detail and with particular reference to the drawings:

In Figure 1 the burner pot of an oil burner is indicated generally at **10**. This unit may be of conventional construction, being provided with burner ring **12** and fuel inlet **14**. The latter is connected through conduit **16** to metering valve **18** for supplying oil or other fluid fuel to the burner at a controlled rate. Valve **18** may be supplied with fuel from any suitable source through conduit **20**.

When igniting the burner, oil fed to it through conduit **16** flows out on the floor of burner pot **10**. There

it is picked up by a wick 22 made of reinforced woven asbestos, or similar non-combustible absorbent material, and contained in perforated holder 24. Holder 24 is formed at its rear terminal portion with a knuckle 26 which is adapted to receive the ignition element 28. The latter element passes through a plug 30 penetrating the sidewall of the burner and the fire pot. It is energized through an electric circuit to be described in detail hereinafter, but including electrical conductors 32, 34 connecting the ignition element to a transformer 36 capable of supplying current at a suitable voltage to the element, e. g. a voltage of about 2 volts.

In this manner the ignition element may be located a safe distance above the burner and the floor of the burner pot, preferably being placed just below the fire ring 12 where it is shielded by the same. In this position it is out of the carbonizing zone and in the coolest part of the burner pot, which greatly prolongs its service life as otherwise it would tend to crystallize and break with use.

Valve 18 employed for supplying fuel at a controlled rate to burner 14 may be of the class wherein a spring pressed plunger permits adjustment of the valve to a selected one of three positions, i. e. closed, pilot fire and full fire. Thus, valve 18 comprises a reservoir which may be partially filled with oil and which contains a cylinder 40 communicating with conduit 16. Cylinder 40 is formed with a centrally positioned valve seat 42 and with suitably positioned ports 44 adapted to pass oil to the interior of the cylinder. Slidably mounted within cylinder 40 is a valve plunger or stem 46 adapted to seat in seat 42.

The upper portion of plunger 46 is formed with or attached to the head member 48 which has an area of reduced diameter adapted to seat the coil spring 50. The latter encircles cylinder 40 and, being under compression, urges plunger 46 outwardly, thereby tending to open the valve, permitting the passage of fuel through port 44 into the lower portion of the cylinder and thence into conduit 16.

Means are provided in valve 18 for adjusting the plunger 46 to its various positions. To this end there is provided a bar 52 which is pivotally attached to a bracket 53 which in turn is attached to the housing of the valve. The free end of bar 52 bears against the upper end of plunger 46. Stationed transversely across the top of bar 52 is a pivotally or resiliently mounted bar 54. Stationed above the latter bar, and positioned in a direction parallel to bar 52 is still another bar 56 which may be suitably attached to bracket 53 mounting bar 52.

Bar 56 serves as a stop to limit the axial movement of plunger 46, stationing the latter in pilot fire position. For this purpose the bar is provided with a projection 58 adapted to bear against the contact member or pin 60 extending transversely of and carried by the bimetal blade 62. The latter together with the electric resistance element 64 form a heat motor mounted on the valve casing and connected to a source of electric current.

To assist in the adjustment of plunger 46 to a selected one of its various positions there is provided a hold down member or rod 66. This member is slidably mounted in bearing 68 penetrating the housing of the valve and extends in a direction parallel to that of plunger 46. The lower end of rod 66 carries horizontal bar 54 while the upper end engages an arm 70 attached to a bimetal blade 72 which together with the electric resistance element 74 form another heat motor. The latter may be mounted in a suitable manner as by being placed within a housing 76 placed on top of valve 18. Like resistor 64, resistor 74 is connected to a source of electric current in a manner to be explained hereinbelow.

Resistors 64 and 74 provide means for automatically adjusting plunger 46 to any one of its three positions. When the elements comprising the valve control assembly are in the position illustrated in Figure 1, the plunger is positioned so that it entirely closes the valve. Upon

upward movement of arm 70, however, which occurs when resistor 74 is energized, rod 66 and plunger 46 move upwardly until bar 54 engages bar 56. The valve then will be in partially opened or pilot fire position. Then when bar 56 is released, which occurs when bimetal blade 62 moves upwardly upon energization of electric resistor 64, further upward movement of the plunger is permitted until the valve is in its wide open or full fire position.

Manual means for controlling the action of the valve also are provided. As is indicated in Figure 4, a vertical rod 80 penetrating the housing of valve 18 may be stationed directly above bars 52, 54 and 56. Rod 80 may be provided with any suitable means for securing its axial displacement, as by means of a cam or screw associated with the control handle 82. This means is conventional and is not illustrated in detail. However, upon turning handle 82, rod 80 is moved downwardly, until it engages bar 56. This in turn holds plunger 46 in its position of maximum downward displacement so that valve 18 remains fully closed irrespective of any subsequent energization of heat motors 64 and 74.

Also associated with the burner assembly and valve in the presently described control apparatus is a thermostat indicated schematically at 83. Thermostat 83 is located in the room area to be heated, and may be of conventional construction. Thus it may comprise a bimetal blade 84 provided at one end with a contact point 85 and mounted at the other of its ends on the support member 86. Opposed to contact member 85 is another contact member 87 mounted on the support member 88. The distance separating contact points 85 and 87 may be adjusted by means of a cam of conventional construction (not illustrated) associated with a calibrated dial 90. Contact point 85 is connected through conductor 92 to terminal 94 while contact 87 is connected through conductor 96 to terminal 98.

Also included in the thermostat assembly is an electrically conducting arm 100 attached to dial 90 and rotatable together with the latter about the pivotal mounting 102. Arm 100 has at its free end a contact point 104 which is adapted to engage a contact plate 106. The latter is of discontinuous construction providing an area wherein contact point 104 will touch a nonconducting material ("off" position), whereupon the circuit is open and the entire system is de-energized, and a conducting area which will complete an electric circuit when contact point 104 is in contact therewith ("on" position), energizing the system. Arm 100 is connected through conductor 108 to terminal 110, while contact plate 106 is connected through conductor 112 to terminal 114.

The presently described automatic control apparatus is correlated with the above described burner assembly, valve and thermostat in a manner which now will be described.

Means first are provided for opening valve 18 to its pilot fire position, for energizing the ignition element 28, and for maintaining the ignition element energized during the initial ignition period when the dial 90 of the thermostat is adjusted so that it is in the "on" position, with point 104 contacting plate 106. To this end there is provided an electric switch 120 which is associated with the bimetal blade 72. Switch 120 is normally open, and is in an electric circuit with ignition element 28 through transformer 36. Although a variety of switches may be employed, a mercury switch preferably is used of the class wherein tilting of the switch results in making or breaking an electric circuit.

Although switch 120 may be mounted directly upon the bimetal blade 72, its action can be made more sensitive by mounting it upon a second bimetal blade 122 attached to blade 72 through pin 124. Blade 122 preferably is in direct contact with blade 72, so that the thermal conductivity of the latter transmits heat from the

resistance element **74** to the blade **122**. Since the latter supports only switch **120**, it may be of relatively light construction, as compared with the heavy blade **72** required to control plunger **46** of the valve. Hence it is relatively sensitive to thermal changes and moves through a wire arc upon being heated and cooled. This motion then makes the circuit through switch **120** before the valve is opened appreciably. It will be apparent that when the circuit is made, ignition element **28** will be energized and when the circuit through switch **120** is broken, element **28** will become de-energized.

Although it is desired to maintain ignition element **28** energized during the initial combustion period so that fuel entering the burner will automatically be reignited following snuff-outs, it is desirable to de-energize the ignition element after the initial ignition period and the snuff-out hazard have passed. For this purpose temperature responsive means are employed to break the ignition element circuit after the desired time interval, e. g. 7 minutes, has elapsed.

The temperature responsive means in the illustrated embodiment comprises a bimetal blade **130** in heat exchange relationship to the burner pot and mounted thereon through bracket **132**. Another bracket **134** is attached to the bimetal blade **130** adjacent its free end, and attached to or operable by this bracket is another electric switch. The latter preferably comprises a mercury switch **136** which normally is in closed position and which is in an electric circuit with switch **120** and ignition element **28**. Hence at the beginning of the operation, the circuit may be completed through the ignition element upon closing normally open switch **120**. However, after the initial combustion period is over, bimetal blade **130** will be activated, opening switch **134**, breaking the circuit and de-energizing the ignition element.

During the initial combustion period it is desirable that valve **18** remain in pilot fire position. However, after the expiration of this period, the valve should be opened to its full fire position. The presently described means for accomplishing this purpose comprises an electric switch associated with the bimetal blade **130** and adapted when closed to energize heat motor **64**. This, in turn, permits the opening of valve **18** to full fire position.

In the illustrated embodiment, this switch comprises the mercury switch **140**, which, like switch **136**, may be carried on bracket **134**. Switch **140** is normally open. However, as the bimetal blade **130** arcs downwardly after the burner has become warm, switch **140** will be closed, completing the circuit to heat motor **64** and opening valve **18** to permit a full flow of oil to burner **14**.

Considering now in greater detail the operation of the presently described control apparatus:

Assuming that the entire system is de-energized and it is desired to turn on the burner, the first operation is to adjust dial **90** of the thermostat so that it is in the "on" position. This will bring contact **104** on arm **100** in contact with plate **106**. A circuit then will be closed from house lines **142**, **144** through transformer **146**, which reduces the voltage from 110 volts to an appropriate level, 12 volts for example. The current then traverses conductors **148**, **150** and **108**, arm **100** (dotted line position), contact plate **106** and conductors **112** and **152**. It then passes through resistor **74**, conductor **154** and thence back to transformer **146**.

When the foregoing circuit has been established, the heat generated by resistor **74** bends bimetal blade **72** upwardly, carrying with it arm **70** and switch **120**. This accomplishes two results. First, it permits the raising of spring pressed plunger **46** until its motion is arrested by stop member **56**. This in turn opens valve **18** to its pilot fire position.

The movement of bimetal blade **72** also closes the normally open switch **120**, which initiates a flow of current from house line **142** through conductor **156**, switch **136**, conductor **158**, switch **120**, conductor **160**, transformer **36**, and thence via conductors **162**, **164** back to house line **144**. This energizes ignition element **28**, which remains energized during the initial combustion period to reignite the burner should a snuff-out occur.

However, after the initial combustion period is over, bimetal blade **130** arcs downwardly, thereby opening the normally closed mercury switch **136**. This breaks the circuit including ignition element **28** so that the latter is de-energized and remains so until the bimetal blade **130** returns to its normal position.

Although the downward arcing of bimetal blade **130** opens normally closed switch **136**, it closes the normally open switch **140**. This in turn initiates an electric circuit through conductors **148**, **170**, **96** and across contact points **85**, **87**, which will be closed when the thermostat has been adjusted to a temperature above room temperature. The current then will flow through conductor **92**, terminal **94**, conductor **172**, electric resistor **64**, conductor **174**, switch **140** and conductor **176**.

Energization of resistor **64** induces the upward arcing of bimetal blade **62** which permits the upward movement of stop **66**, this in turn permitting the further upward movement of spring pressed plunger **46** and opening valve **18** to its full fire position.

The burner will continue to operate at full fire until one of several contingencies occurs. In the event that a snuff-out inadvertently should occur, even at full fire, the bimetal blade **130** would return to its normal position upon cooling of the burner. This would open switch **140** which in turn would de-energize electric resistor **64**, returning the valve **18** to its pilot fire position. It also would close switch **136**, energizing the ignition element **28** which would reignite the burner.

If a power failure should occur the entire circuit would be broken. After cooling of the burner, however, the bimetal blade **130** would return to its normal position, opening switch **140** and closing switch **136** so that, upon the resumption of power service, valve **40** would remain in its pilot fire position and ignition element **28** would be activated for reignition of the burner.

When, as in the usual case, the system operates at full fire until the thermostat is satisfied, the bimetal blade **84** of the latter will separate contact points **85** and **87** breaking the circuit through the resistor **64**. Bimetal blade **62** then will return to its normal position, adjusting valve **18** to pilot fire position. The system then will remain at pilot fire, with ignition element **28** de-energized (unless a snuff out should occur), until the thermostat again demands heat.

When the thermostat dial is adjusted to the "off" position, contact point **104** is moved away from plate **106**, breaking the circuit including resistor **74**. As a result, blade **72** completely closes valve **18** and opens switch **120**. Also blade **130** upon returning to its normal position after cooling of the burner will close switch **136** and open switch **140**. The entire system thus will be inactivated until such time as dial **90** is adjusted to the "on" position.

Thus it will be apparent that by the present invention I have provided an ignition and fuel supply control apparatus for fluid fuel burners, which, while simple in construction and involving a minimum of constituent parts, effectively controls the operation of the burner so that it operates reliably and safely. By the operation of my apparatus, the burner is ignited automatically after snuff-outs without any hazard whatsoever of explosion due to accumulated combustible vapors, or of the ignition of a large quantity of oil which may have accumulated within the burner pot. In addition the control is operable even in the event of a power failure, and lends itself for combination with a manual control if such is desired.

It is to be understood that the form of my invention,

herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of the parts may be resorted to, without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. Ignition and fuel supply control apparatus for fluid fuel pot-type burners comprising in combination a burner pot, valve means for supplying fuel to said burner pot, room temperature thermostat switch means, an electrically operable heat motor, an electric circuit including the heat motor and thermostat switch means, a first electric switch mechanically connected to the heat motor, an electric circuit including said first electric switch, an electrically operable ignition element placed in operative relations to the burner pot and in the electric circuit with the first switch, temperature responsive means mounted in heat exchange relation with the outer side of the burner pot and actuatable at a pre-determined temperature level of the burner pot, a second switch mechanically connected to the temperature responsive means and in the electric circuit with the ignition element, the heat motor being mechanically associated with the valve means and first switch to open the valve means and close the first switch when said heat motor is energized, thereby energizing the ignition element, and the temperature responsive means being mechanically associated with the second switch to open the second switch and to de-energize the ignition element when the burner pot has reached said pre-determined temperature level.

2. The ignition and fuel supply control apparatus of claim 1 wherein the heat motor includes a bimetal blade connected to the valve means and the first electric switch comprises a mercury switch mounted on the bimetal blade.

3. The ignition and fuel supply control apparatus of claim 1 wherein the temperature responsive means comprises a bimetal blade and the second switch comprises a mercury switch mounted on the bimetal blade.

4. The ignition and fuel supply control apparatus of claim 1 wherein the heat motor includes a first bimetal blade mechanically associated with the valve means, the first electric switch comprises a mercury switch mounted upon the first bimetal blade, the temperature responsive means comprises a second bimetal blade, and the second electric switch comprises a mercury switch mounted upon the second bimetal blade.

5. Ignition and fuel supply control apparatus for fluid fuel pot-type burners comprising in combination a burner pot, valve means for supplying fuel to said burner pot, said valve means including a spring pressed plunger for regulating the flow of fluid through the valve, room temperature thermostat switch means, an electric resistance element, an electric circuit including said resistance element and thermostat switch means, a bimetal blade in heat exchange relation with the electric resistance element and positioned to operate the spring pressed plunger of the valve, a first electric switch stationed adjacent the bimetal blade and operable by the movement of the same, an electric circuit including said first electric switch, an electrically operable ignition element stationed in operative relation to the burner pot and in the electric circuit with the first switch, temperature responsive means mounted in heat exchange relation with the outer side of the burner pot and actuatable at a pre-determined temperature level of the burner pot, and a second electric switch mechanically connected to the temperature responsive means and in the electric circuit with the ignition element, the bimetal blade being mechanically associated with the valve means and first switch to close the first electric switch and to open the valve means and to energize the ignition element when said resistance element is energized and when the thermostat circuit is closed, and the temperature responsive means being mechanically associated with the second switch to open the second switch and to de-energize the ignition element when the burner pot has reached said pre-determined temperature level.

6. Ignition and fuel supply control apparatus for fluid fuel pot-type burners comprising in combination a burner pot, valve means for supplying fuel to said burner pot, said valve means including a spring pressed plunger for regulating the flow of fluid through the valve, room temperature thermostat switch means, an electric resistance element, an electric circuit including said resistance element and thermostat switch means, a bimetal blade in heat exchange relationship with the electric resistance element and positioned to operate the spring pressed plunger of the valve, a second bimetal blade in heat exchange relation with the first bimetal blade, the second bimetal blade being more heat responsive than the first, a first electric switch mounted on the second bimetal blade and operable by the movement of the same, an electric circuit including said first electric switch, an electrically operable ignition element stationed in operative relation to the burner pot and in the electric circuit with the first switch, temperature responsive means mounted in heat exchange relation with the outer side of the burner pot and actuatable at a pre-determined temperature level of the burner pot, and a second electric switch mechanically connected to the temperature responsive means and in the electric circuit with the ignition element, the bimetal blade being mechanically associated with the valve means and first switch to close the first electric switch and to open the valve means and to energize the ignition element when said resistance element is energized and when the thermostat circuit is closed, the first electric switch being closed before substantial opening of the valve, and the temperature responsive means being mechanically associated with the second switch to open the second electric switch and to de-energize the ignition element when the burner pot has reached said pre-determined temperature level.

7. Ignition and fuel supply control apparatus for fluid fuel pot-type burners comprising in combination a burner pot, valve means for supplying fuel to said burner pot, said valve means being adjustable between pilot fire and full fire positions, room temperature thermostat switch means, an electrically operable heat motor, an electric circuit including said heat motor and thermostat switch means, a first electric switch mechanically connected to the heat motor, an electric circuit including said first electric switch, an electrically operable ignition element placed in operative relation to the burner pot and in the electric circuit with the first switch, temperature responsive means mounted in heat exchange relation with the outer side of the burner pot and actuatable at a pre-determined temperature level of the burner pot, a second electric switch mechanically connected to the temperature responsive means and in the electric circuit with the ignition element, a second electrically operable heat motor, an electric circuit including said second heat motor, and a third electric switch mechanically associated with the heat responsive means and in the electric circuit with the second heat motor, the first heat motor being mechanically associated with the valve means and first switch and operable when energized when the thermostat circuit is closed to close the first electric switch and to open the valve means to pilot fire position and to energize the ignition element, the temperature responsive means being mechanically associated with the second and third switches and operable when the burner pot has reached that pre-determined level to open the second electric switch for de-energizing the ignition element and to close the third switch for energizing the second heat motor, the second heat motor being mechanically associated with the valve means and operable when the burner pot has reached said pre-determined temperature level to adjust the valve means to its full fire position.

8. The ignition and fuel supply control apparatus of claim 7 wherein the temperature responsive means com-

prises a bimetal blade and the third electric switch comprises a mercury switch mounted thereon.

9. Ignition and fuel supply control apparatus for fluid fuel pot-type burners comprising in combination a burner pot, valve means for supplying fuel to said burner pot, said valve means including a spring pressed plunger adjustable to pilot fire and full fire positions, room temperature thermostat switch means, an electrically operable heat motor, an electric circuit including said heat motor and thermostat means, a first electric switch mechanically associated with the heat motor, an electric circuit including said first electric switch, an electrically operable ignition element placed in operative relation to the burner pot and in the electric circuit with the first electric switch, temperature responsive means mounted in heat exchange relation with the outer side of the burner pot and actuatable at a pre-determined temperature level of the burner pot, a second electric switch mechanically connected to the temperature responsive means and in the electrical circuit with the ignition element, a bimetal blade and an electric resistance element arranged in heat exchange relation, the blade being mechanically associated with the valve means for adjusting the same between pilot and full fire positions, and a third electric switch mechanically associated with the temperature responsive means and in the electric circuit with the electric resistance element, the heat motor being mechanically associated with the valve means and first switch and operable when energized to close the first switch and to open the valve means to pilot fire position and to energize the ignition element when the thermostat circuit is closed, and the temperature responsive means being mechanically associated with the second and third switches and operable when the burner pot has reached the said predetermined temperature to open the second electric switch and de-energize the ignition element and to close the third electric switch and energize the electric resistance element.

10. Ignition and fuel supply control apparatus for fluid fuel pot-type burners comprising in combination a burner pot, valve means for supplying fuel to said burner pot, the valve means including a spring pressed plunger adjustable to pilot fire and full fire positions, room temperature thermostat switch means, a first electric resistor, an electric circuit including said first electric resistor and said thermostat switch means, a first bimetal blade in heat exchange relationship with the first electric resistor, a first electric switch mechanically associated with and operable by the movement of the first bimetal blade, an electric circuit including said first electric switch, an electrically operable ignition element placed in operative relation to the burner pot and in the electric circuit with the first electric switch, temperature responsive means mounted in heat exchange relation with the outer side of the burner pot and actuatable at a pre-determined temperature level of the burner pot, a second electric switch mechanically associated with and operable by the temperature responsive means and in the electric circuit with the ignition element, a second bimetal blade, a second electric resistor in heat exchange relationship with the second bimetal blade, an electric circuit including said second electric resistor, a third electric switch in the circuit of the second resistor and stationed adjacent the temperature responsive means and operable thereby, the second bimetal blade being positioned to engage and adjust the spring pressed plunger of the valve between pilot and full fire positions; the first bimetal blade being mechanically associated with the first switch and operable to close the first electric switch and energize the ignition element when the first resistor is energized when the thermostat circuit is closed, the temperature responsive means being mechanically associated with the second and third switches and operable when the burner pot has reached the pre-determined temperature level to open the second switch and de-energize the ignition element, and also to close the third electric switch and energize the second electric resistor, thereby actuating the second bimetal blade for adjustment of the plunger to full fire position.

11. Ignition and fuel supply control apparatus for fluid fuel pot-type burners comprising in combination a burner pot, valve means for supplying fuel to said burner pot, the valve means being adjustable to pilot fire and full fire positions, a room temperature thermostat switch including a manual switch and a temperature actuated switch, electrical circuits for said switches, a first electrically operable heat motor in the circuit of the manual switch, a first electric switch mechanically connected to the first heat motor, an electric circuit including said first electric switch, an electrically operable ignition element placed in operative relation to the burner pot and in the circuit of the first electric switch, temperature responsive means mounted in heat exchange relation with the outer side of the burner pot and actuatable at a pre-determined temperature level of the burner pot, a second electric switch mechanically connected to the temperature responsive means and in the circuit of the ignition element, a second electrically operable heat motor in the circuit of the thermostat temperature actuated switch, and a third electric switch mechanically connected to the temperature responsive means and in the circuit of the second heat motor, the first heat motor being mechanically associated with the valve means and first electric switch and operable when energized when the thermostat manual switch is closed to close the first electric switch and to open the valve means to pilot fire position and to energize the ignition element, the temperature responsive means being mechanically associated with the second and third electric switches and operable when the burner pot has reached said pre-determined level to open the second electric switch for de-energizing the ignition element and to close the third electric switch for energizing the second heat motor, the second heat motor being mechanically associated with the valve means and operable when the burner pot has reached said pre-determined temperature level and when the thermostat temperature actuated switch is closed to adjust the valve means to its full fire position.

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